Data Management in the I&M Program

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Emerging technologies, increasing Internet speeds and ever-expanding computing power enhance scientists' ability to collect, analyze, and share data. Concurrently, natural resource managers have growing needs and expectations regarding the timeliness, accuracy, and accessibility of scientific research. Internet technologies are increasingly critical tools for the NPS Inventory and Monitoring Program (I&M) to use for documenting, publishing, and delivering information to both researchers and decision makers.

One example of how I&M's approach overcomes modern data management challenges and meets users' needs and expectations is illustrated by the Southeast Alaska Network's oceanography vital sign. Sixteen years of physical observations, about 250,000 records, have been collected in Glacier Bay. While these data are a valuable resource for decision making by park management and have potential for use by other researchers, they remained formally undocumented and unpublished as late as 2007. Non-NPS researchers interested in the ocean's response to global warming in Alaska, as an example, would have had to work very hard to learn such data existed. Once discovered, more work would be needed to obtain the data, learn its structure and collection methodology, evaluate its quality, and determine if it could be adapted to fit the researchers' objectives. Today, however, someone searching the terms "SEAN Oceanography" will locate the authoritative dataset, query the data through a browser, and download it to his/her desktop in minutes – including metadata and associated reports.

In addition to websites, NPS employs web services to deliver data from remote servers to desktop applications in real-time. For example, the Arctic Network (ARCN) uses web mapping services to distribute large-scale imagery that previously had to be physically mailed to clients. Bill Manley, of the University of Colorado's Institute of Arctic and Alpine Research, has compiled a dataset of high resolution imagery for monitoring coastlines in Bering Land Bridge National Preserve and Cape Krusenstern National Monument. The imagery consists of orthorectified digital photography, at 1 meter or better resolution, over three timeslices ranging from 1950 to 2003. Recognizing the high potential for secondary use of the dataset, ARCN teamed with the Geographic Information Network of Alaska (GINA) of the University of Alaska Fairbanks to publish the dataset as a web map service (WMS). The imagery can now be loaded seamlessly into any WMS-capable Geographic Information System or viewed through a variety of on-line mapping applications such as AlaskaMapped, Swath Viewer, Yahoo! Maps and Google Earth.

By focusing on innovative use of information technology and internet-based distribution, the I&M Program is successfully delivering data and decision support tools like never before. These approaches successfully support research and management, and also allow NPS professionals to more quickly and effectively accomplish our mission.

Figure 1. The Alaska Region of the NPS public web site at http://science.nature.nps.gov/im/units/AKRO/ is a convenient place to find links to the four I&M networks in the state.

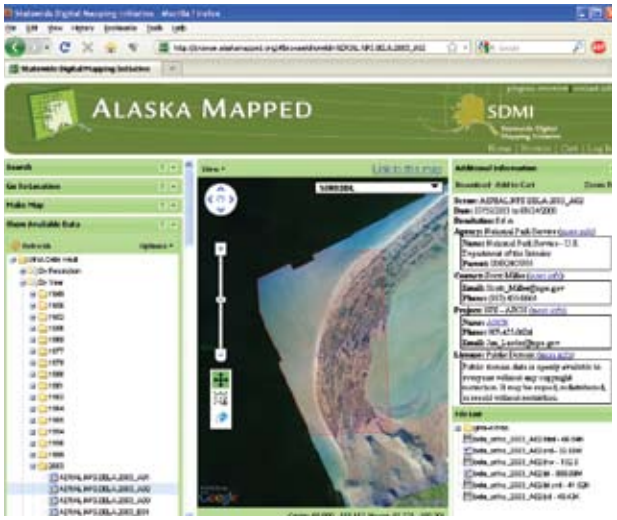

Figure 2. Imagery from the Arctic Network Coastal Erosion Monitoring program as seen through the Alaska Mapped website. The imagery is available through the internet as a web mapping service provided by the Geographic Information Network of Alaska.